

BROWN COUNTY PROJECT #2416

223 CHESTNUT CONNECTION

PROJECT OWNER:
BROWN COUNTY TECHNOLOGY SERVICES
111 N. JEFFERSON
GREEN BAY, WI 54301

PROJECT ENGINEER:
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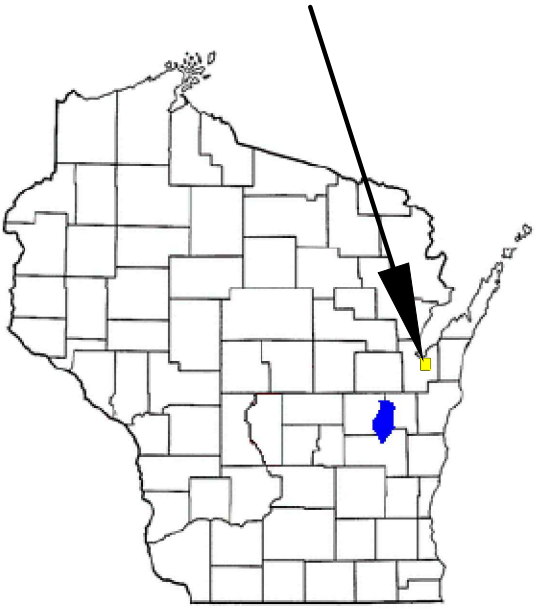
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PERMITS REQUIRED:
CITY OF GREEN BAY EXCAVATION/OBSTRUCTION PERMIT
CITY OF GREEN BAY EROSION CONTROL CERTIFICATE

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Project Location

City of Green Bay , WI



CALL DIGGERS HOTLINE 3 DAYS BEFORE DIGGING:
AT 811 OR (800) 242-8511
EMERGENCY ONLY: (262) 432-7910

ALL UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE. UTILITY INFORMATION WAS PROVIDED IN RESPONSE TO PLANNING LOCATE REQUESTS. CONSTRUCTION CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF MUNICIPAL AND PRIVATE UTILITIES; COMPLETE REPAIR OF ANY AND ALL DAMAGES & RESTORATION INCURRED SHALL BE AT THE EXPENSE OF THE CONTRACTOR. FACILITY PLACEMENT SUBJECT TO CHANGE UPON FIELD LOCATE COMPLETION.

RIGHTS-OF-WAY ARE DEPICTED BASED ON FIELD OBSERVATIONS AND THE LATEST STATE AND COUNTY RECORDS AVAILABLE.

COORDINATE SYSTEM: HARN/BrownWI-F

Legend

= Telco	= Fiber Ped	= Manhole	= Culvert
= Cable TV	= Electric Ped	= Utility Pole	= Railroad Light
= Electric	= Telco Ped	= Power Pole	= Traffic Light
= Gas	= Cable TV Ped	= Power Transformer Pole	= Pull Box
= Water	= Traffic Control Box	= Street Light	= Tree
= Sanitary Sewer	= Electric Transformer	= Pole Anchor	
= Storm Sewer	= Gas Valve	= Aerial Fiber	
= Private Fiber Optic	= Water Valve	= Overhead Guy	
= New Underground Fiber	= Fire Hydrant	= Aerial Expansion Loop	
= Existing Underground Fiber	= Catch Basin	= Aerial Splice	
= New Handhole	= Round Catch Basin	= Standoff	
= Existing Handhole			
= Locate Station			

Typical Install Depth is 36"



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BROWN COUNTY #2416
232 CHESTNUT CONNECTION

SHEET GROUP:
COVER SHEET

SHEET ID:
CS1

EXCAVATIONS

Excavations shall not remain open in excess of 24 hours unless specific permission is obtained from the City Engineer.

In all streets, alleys, sidewalks or other public ways, whether improved or unimproved, all excavated material shall be removed and the trench shall be backfilled with flow-able filled slurry mix.

At no time can spoils or other debris be stored or piled in the street gutter.

Excavation stock piling must remain within the public right of way and cannot be placed on or impede any roadways, driveways, sidewalks, or fire hydrants. Any areas that have minimal public right of way available must stock pile the excavated material on a truck bed or trailer. No stock piling of excavated material will be allowed on private property.

Excavations are to remain outside of wetland areas. All excavations must have proper erosion control practices to prevent stock piled materials from entering wetland areas.

Excavations are to remain 75' from the high-water mark of and waterway. Any excavations must have proper erosion control practices to prevent stock piled materials from entering waterways.

EROSION CONTROL PLAN

- Any prolonged open excavations or standing debris piles will require erosion control practices such as sandbagging, placing hay bales, or silt fencing around the area.
- The Contractor must employ the following good housekeeping practices that will prevent the ingress of any excavated materials into the Municipal storm water system:
- 1) Cover Storm Sewer Inlet with DOT Filter Fabric (DOT Type FF, not felt or silt fence material) near areas where excavation and directional drilling operations occur. DOT Type C Inlet protection standards apply (2x4 across back of inlet with DOT Filter Fabric over inlet held in place by inlet cover). Type D Inlet Protection including waddles (fiber filled filter socks) around drains to prevent debris from entering the storm sewer system are required at any low area inlets.
 - 2) Place Silt Fence Barrier around excavation per below typical specification Diagram. Silt Fence to be inspected prior to excavation.
 - 3) Place Sand Bag Barrier around Spoils to prevent runoff ingress into Storm Water Management System.
 - 4) Protect graded restoration area using fibrous matting to prevent erosion into Storm Water Management System
 - 5) Place temporary soil stabilization materials to prevent erosion into Storm Water Management System.

All erosion control measures shall be inspected on a weekly basis and/or after ½” or more of rainfall to ensure the effectiveness of the erosion control measures.

DEWATERING

Dewatering of pits, trenches, handholes, or manholes must be done with the use of a sediment bag, a straw bale dewatering basin, or approved equivalent. All dewatering procedures must meet or exceed state standards. All Vacuum Excavation spoils are to be transported and disposed of offsite at an approved dumping station. Dewatering is expected to be negligible given the depth of installation and the nature of the directional boring operations for this project.

FRAC-OUT CONTINGENCY PLAN

Boring activities and bore path are to be continually monitored to observe potential frac-outs. Erosion control materials are to be accessible and onsite should a frac-out occur. Acceptable materials include silt fence, straw bales, and sand bags. As soon as a frac-out is discovered, erosion control must immediately be implemented around the frac-out material (bentonite-water mixture). A vacuum excavation machine is to be accessible on short notice to clean any frac-out material should it occur.

RESTORATION

The Contractor may be allowed to mechanically core through hard surface streets to locate existing utilities provided that the restoration of the core be performed per the specific requirements of the Municipality or Agency having jurisdiction. Core holes must be backfilled with a slurry mixture as specified by the DOT per permitting requirements. The original Concrete or Asphalt core can then be replaced using Plug and Epoxy method.

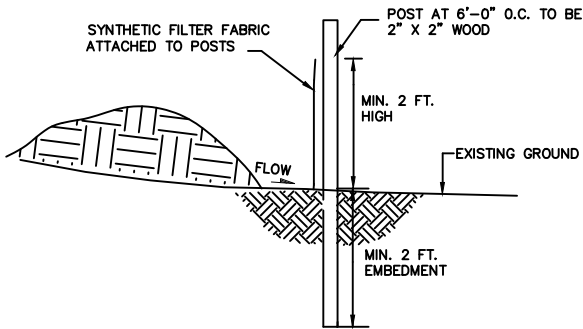
Potholing is not allowed in ADA compliant or non-compliant pedestrian ramps. Any hard surface excavations within any pedestrian ramp panels will result in the Contractor's replacement of the entire ADA Compliant panel, along with adjacent panels at the Contractor's expense.

At no time can the Contractor perform any excavation that undermines the adjacent in-tact surfaces, thereby making vertical mechanical compaction impossible and creating future potential for subsurface failure. This scenario will result in the replacement of the effected hard-surface to the permitting authority's specifications.

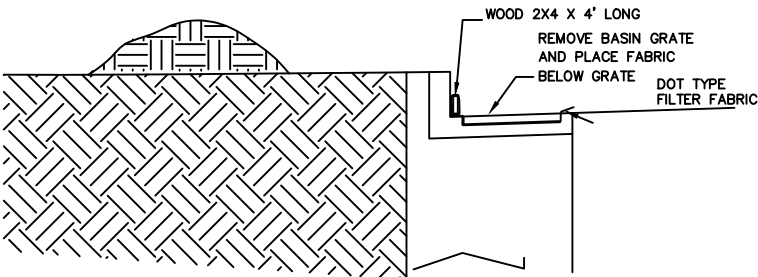
All disturbed lawns, vegetation, flowers, shrubbery, trees, landscaping, etc. must be replaced or restored to its previous condition or better. Lawn repair will require a minimum of 4” of black dirt and municipal approved grass blends are to be applied.

All areas of restoration using Black Dirt and Seed must be protected with biodegradable net-free fibrous matting. Placement of loose straw or other materials that can be easily blown away or otherwise eroded/removed from the restored area will not be permitted. Fibrous matting materials will must be included in the Contractor Cut Sheets and approved by the Owner for use prior to placement.

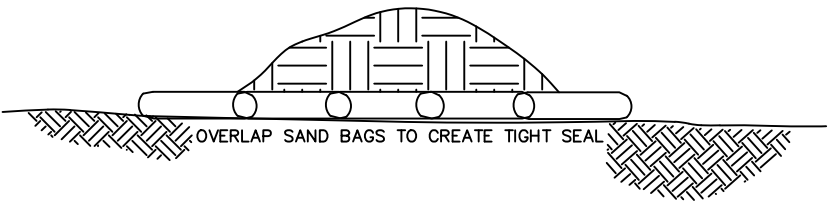
Silt Fence Erosion Control:



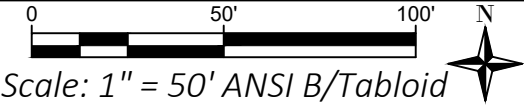
Storm Inlet / Catch Basin Erosion Control:



Sand Bag Barrier Erosion Control:



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BROWN COUNTY #2416
232 CHESTNUT CONNECTION

SHEET GROUP:
EROSION CONTROL

SHEET ID:
EC

Section T2 UNDERGROUND CONSTRUCTION GUIDELINES

(See Bid Docs for Section 1 Bidding Guidelines)

T2.01 Duct Placement Guidelines

The Contractor is responsible to provide all duct, handholes, locate posts, locate stations, locate wire, and pull rope as part of their installation responsibilities. The HDPE Duct part number referenced in Section T6 - Contractor Provided Materials, references a duct that includes a mule tape for cable installation. The Contractor will be required to provide all mule tape necessary for cable installations whether it be included with the duct at the time of purchase or provided and installed separately.

All ducts will be placed on the routes identified in the attached CAD Plans. All ducts must maintain a minimum horizontal clearance zone of 18” when paralleling other underground utilities with the exception of City Water, Sewer, and Storm where a 6’ horizontal clearance and 24” vertical clearance is required. The routes on the attached CAD plans have taken this additional clearance into consideration.

All underground ducts must be placed a minimum of 36” below finished grade wherever possible. Instances where the duct must be placed at a shallower or drastically deeper depth must be brought to the attention of the Project Manager prior to installation.

The Owner’s Project Manager will be on site to coordinate and mark the duct placement route and handhole locations once all locates have cleared. Routes will be marked with the use of paint and flags. The Contractor must not place duct along the route without first reviewing the individual areas with the Project Manager. This measure is designed to avoid instances where the new duct may encroach the restricted clearance zones of other utilities or extend outside the Right of Way.

All exposed duct ends must be covered with a temporary plug or adequately sealed with duct tape to prevent the ingress of dirt, water, and debris prior to the installation of the cable, locate wire, and mule tape.

All empty ducts (if any) must be sealed using properly sized duct plugs.

Where ducts are coupled together, the contractor must use an aluminum threaded coupler.

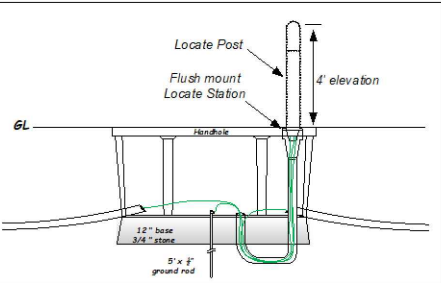
T2.02 Handhole Placement Guidelines

The Contractor may be required to place new Large 36”x60”x36” pre-cast handholes, Medium 30”x48”x36” pre-cast handholes, Small 24”x36”x36” pre-cast handholes, or Extra Small 17”x30”x24” pre-cast handholes along the route as shown on the project CAD Plans. Large Handholes must be Quazite PG3660BB36 base with PG3660HH21 Extra Heavy Duty (ANSI Tier 22) 2-piece lid marked “Fiber Optics”. Medium Handholes must be Quazite PG3048BB36 base with PG3048HH21 Extra Heavy Duty (ANSI Tier 22) 2-piece lid marked “Fiber Optics”. Small Handholes must be Quazite PG2436BB36 base with PG2436HH21 Extra Heavy Duty (ANSI Tier 22) 1-piece lid marked “Fiber Optics”. Extra Small Handholes must be Quazite PG1730BA24 base with PG1730HH21 Heavy Duty (ANSI Tier 22) 1-piece lid marked “Fiber Optics”. Manufacturer substitutions or equals will not be allowed for the handholes and lids.

The handholes must sit parallel with adjacent streets, buildings, or other structures and must be flush with all surrounding surfaces, and if installed on a slope or grade the handhole must follow the contour of the grade as much as possible.

The installed handholes must sit atop a 12” bed of ¾” washed, crushed stone for drainage - pea gravel or other stone smaller than ¾” is not an acceptable base for drainage. All fill around the Handhole must be mechanically compacted in 12” layers to within 8” from the top to prevent settling.

Inside each new handhole the Contractor will be required to install a single 5' long by 1/2” diameter copper clad ground rod. The ground rod must not protrude more than 6” above the surface of the crushed stone bed. After ground rod installation, the Contractor must equip the top with a conductor clamp that will allow the Contractor to tie a locate wire to the end.



T2.03 Locate Wire and Post/Station Placement Guidelines

All locate wires will be installed outside the duct. A suitable locate wire for this purpose is identified within the Contractor-provided materials list in Section 6.01.

The Contractor will be required to install flush mount locate stations or above grade locate posts adjacent to handholes identified on the CAD Drawings. The locate stations and posts will be used to access the locate wires for future locating purposes.

Between the handhole and locate station or post the contractor must install a short length of 1-1/4” underground plowduct. This will facilitate the installation of the locate wires into the post from the handhole. At no time will a locate station or post be installed in a location where it impedes or can be damaged by the removal of the handhole lid.

At the below grade building entry point the locate wire must be run above grade using ½” galvanized steel conduit. Locate wire will be housed in a single gang outdoor rated outlet box approximately 3’ above grade.

T2.04 Mule Tape Installation Guidelines

The Contractor will be required to install a single 1,800 lb mule tape within the plowduct during the installation of the fiber optic cable.

T2.05 Fiber Optic Cable Installation Guidelines

The Contractor can install the fiber optic cable by hand or with the use of pneumatic/hydraulic installation equipment. However the means of installation, the Contractor must take care to not exceed the cable's maximum pulling tension (typically 600lbs). The Contractor must utilize a breakaway/swivel device at all times while installing the fiber optic cables. Multiple swivels must be used; one for the cable, and another set 8” back from the first for the mule tape.

At each handhole the Contractor must store a cable slack loop (Slack Loop length noted on the CAD Plans) neatly coiled and labeled with a permanent label, identifying the Cable's owner and identifying the specific cable strand count. Suitable labels for this purpose are Panduit #PST-FO.

Following cable installation all occupied ducts must be plugged using a split plug appropriately sized to accommodate the cable diameter - do not use foam, putty, or tape to plug any duct. All spare ducts must be sealed using properly sized duct plugs.

Instances where multiple ducts are being placed, all cables and mule tape will be installed inside one duct, while the other duct will only contain mule tape for future installations.

T2.06 Underground Installation Documentation

The Contractor will be required to provide bore logs showing rod placement dates and depths as well as redline drawings showing cable placement and cable footage sequential markings within the underground duct and interior piping.

Section T3 INTERIOR CONSTRUCTION GUIDELINES

Above Grade Building Entries:

Where the underground plowducts extend to the exterior of a building, the contractor is required to transition below grade from each plowduct to a Galvanized Rigid Steel pipe that extends up the side of the exterior wall. At the below-grade transition point where the rigid pipe meets the plowduct, the Contractor must utilize a watertight fitting that is rated for underground use (ETCO Specialty Products “E-Loc” DEL-237 or equivalent).

At the top of the new rigid pipe runs the contractor must core a 2” hole into the building and install a 12”x12”x6” NEMA 3R rated pull box over the hole and aligned so the building core is situated at the top of the pull box.

All new cores into each building must be sleeved with EMT. Interior EMT extending to a termination room can extend through the core to satisfy this sleeve requirement, however instances where Interior EMT is not being placed the Contractor must sleeve the core with EMT and securely fasten the sleeve to the exterior pull box and inside the building. All sleeves/EMT ends must be equipped with collared fittings to avoid cable damage.

Extending out of the bottom of the outdoor pull box, the Contractor must install a 1/2” Rigid Steel pipe down to an elevation of 4’ above finished grade. At the end of this pipe the contractor must install a single gang outdoor outlet box with gasketed2-screw cover to house the locate wire.

All new exterior pipes and boxes must be securely fastened to the building wall with anchors and fastening hardware suitable for a permanent installation into the materials comprising the wall.

T3.02 Interior Workmanship

Contractor shall take precautions to ensure that dust and debris associated with the project is contained within the work area and not allowed to spread into other areas of the school. Equipment or materials, which cannot be moved, shall be covered by the Contractor to prevent contamination or damage.

All materials used by the Contractor shall be certified asbestos-free by the manufacturer. There will be no exceptions. A letter from the Contractor certifying that no asbestos-containing materials were used shall be provided upon request. Contractor shall assure that any and all equipment used on this project will be handled and operated in conformance with OSHA safety requirements. Contractor shall advise the owner whenever work is expected to be hazardous to building occupants. Contractor shall maintain fire extinguisher within easy access whenever power tools; flammable materials or heat producing devices are being used. Contractor shall advise the owner when volatile materials are to be used near air ventilation intakes or near occupied spaces so that action may be taken to prevent degradation of indoor air quality.

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T3.03 Interior EMT/Innerduct Installation Not Required

T3.04 Interior Cable Installation

At each site the cable will be installed through the new or existing EMT/Innerduct to the termination point. At each storage box along the route the Contractor must store a 30' expansion loop. This does not include at the 12x12x6 pull box locations.

Instances where the interior path uses existing Innerduct, EMT, or other pipe that does not contain an existing pull rope, the contractor may be required to fish the existing pathway and install a pull rope to aid in the installation of the Fiber Optic Cable.

Following the installation of the fiber optic cable through the exterior and interior EMT conduit or innerduct, the Contractor must seal the conduit or innerduct ends (where the EMT enters the outside pull box and where the EMT enters the termination room) with ASTM E814 (UL 1479) approved fire stop materials.

Section T4 CABLE SPLICING TERMINATION AND TESTING GUIDELINES

T4.01 Cable Pre-Acceptance Testing

The Contractor crews must perform “pre-acceptance testing” with an Optical Time Domain Reflectometer (OTDR) on each fiber optic cable reel. The pre-acceptance testing will verify the performance of the cable prior to it being installed. Pre-acceptance testing must be performed on every cable strand at 1310nm and 1550nm only from the exposed end of the cable. Test results must be provided to and approved by the Project Manager prior to installation.

T4.02 Outdoor Fusion Splicing

The Contractor will be required to Fusion Splice the fiber optic cables at each of the splice points identified on the CAD Plans. The Owner will provide all splice cases and trays while the Contactor must provide all splice sleeves and consumables.

T4.03 Indoor Fiber Termination

All cable terminations will be performed by splicing factory terminated fiber optic cable pigtails to the ends of the fiber optic cables. The Owner will provide all pigtail assemblies and cable termination and interior splicing panels while the Contactor must provide all splice sleeves and consumables. The Contractor will be required to install all Owner-provided Termination and Splice equipment as well as route all pre-terminated pigtails between devices.

T4.04 Fusion Splicing Equipment

All cable strand splicing will be performed using a fusion splice machine that is capable of splicing within a 0.2dB loss tolerance and equipped with either live monitoring or a Local Injection Detection (LID) testing system, thus ensuring the splice quality while the splice is set up in the machine.

All splices will be protected with appropriate fusion splice sleeves fitted with steel-reinforcing rod(s) (provided by the Contractor).

T4.05 Cable Testing

Following the splicing and termination procedures the Contractor will be required to test each strand using an OTDR and Power Meter Light Source (PMLS) at 1310nm and 1550nm. Each terminated strand will be tested between the sites with both devices at both wavelengths. This totals 8 tests per strand. All OTDR tests must be performed using a launch cable that is at least 500 meters in length thus allowing a full view of the initial pigtail connector/splice event loss.

T4.06 OTDR Viewing Software

Prior to the OTDR testing the Contractor must provide a copy of the OTDR viewing software that is capable of allowing a user to electronically review the test results. This does not need to be a licensed copy, just one that allows the user to view traces in their native (non-pdf) format.

T4.07 Test Documentation

Following the OTDR testing the Contractor must provide the Owner with one electronic copy of each test performed. Prior to testing, the Contractor will be provided with the strand identification and labeling plan, the electronic copies of the test results must match the labeling scheme provided to the Contractor.

Following the PMLS testing, the Contractor must provide the Owner with test results showing the total link loss between each site along with the average loss for each strand. The test results must be provided on any Windows® compatible electronic spreadsheet. Each cable strand tested must be labeled per the Owner-provided labelling scheme. This labelling must accompany each test results.

T4.08 Optical Loss Budget

The Contractor will be provided with optical link budgets for each installed cable strand. Budget losses are calculated by measuring the total link loss between sites, and then averaging the measurements from both directions using the parameters identified in Table 1 below. The test results provided to the Project Manager must confirm that 100% of all installed strands perform within the optical loss budget and within the specific tolerances for individual events identified in Event Loss Table below.

Note that even though a link loss test may show a loss that is within the optical budget, any event shown by the OTDR report that exceeds its thresholds listed in the Table will result in a failed test result and must be remedied prior to system acceptance by the Owner. Instances where individual tolerances cannot be met must be reviewed with the Project Manager prior to completion.

Section T5 INDIVIDUAL PROJECT CONSTRUCTION QUANTITIES

T5.01 Use of Quantities Shown

The following lists only represent a high-level overview of the tasks associated with each individual project and should not be solely relied upon for bidding purposes. It is the Contractors responsibility to thoroughly review the project routes, CAD Plans to calculate their own quantities and footages to complete the project as outlined in this document. The Bid amount must be adequate to fulfill the intent of the entire project.

T5.02 Construction Quantities

This project consists of the following high-level tasks. It is the contractor's responsibility to verify their own quantities prior to submitting their bid.

Project Quantities	Description	Quantity
140'	Provide and Install 2" duct, with pull rope and locate wire along path shown on CAD Plans	140'
355'	Pull new cable through new 2" duct	355'
100'	Pull new cable through existing 2" interior pathway containing single 288 strand fiber optic cable	100'
1	Provide and install 24x36x36 Quazite Handhole over existing and new duct - open existing duct	1
1	Provide and install flush mount locate station adjacent to long wall of handhole - streetside	1
12	Terminate 6 strands within existing panel (Clearfield Cassette) inside District Office Building, terminate 6 strands inside contractor-provided Wall Mount Termination Panel (Total Cable Solutions or equivalent) within Chestnut facility	12
6	Test terminated strands with PMLS and OTDR between sites	6

Section T6 CONTRACTOR PROVIDED MATERIALS

T6.01 Contractor Provided Material List

- 1. Underground Plowduct - 2" inside diameter first-run SDR-11 HDPE Orange smooth exterior/smooth interior. Carlon A13C6N1JNNE (2") or approved equivalent.
- 2. Flush-mount Handhole Medium - Composite concrete fiberglass construction 24"x36"x36h" with 2 bolt extra heavy duty cover marked "Fiber Optics". Quazite #PG2436BB36 Base / #PG2436HH21 (ANSI Tier 22) 2-piece Cover (no substitutions or equivalents).
- 3. 1800 pound mule tape - Carlon TL38203 or equivalent.
- 4. Locate Wire - #12 AWG HDPE jacketed, steel core copper clad wire. Pro-Trace #HDD-CCS-PE45 or equivalent.
- 5. Split Duct Plug - 2" outside diameter split plugs with interior port diameter sufficient for cable size. Carlon or equivalent.
- 6. Ground Rod - 5'x1/2" copper clad ground rod. Non-manufacturer specific.
- 7. Flush Mount Locate Housing with cast iron housing and collar - Handley Industries 2" Cathodic test station Part Number T2IC5F1LQ, or equivalent.
- 8. NEMA 3R rated building entry box - 12x12x6 w/ screw cover Hoffmann or equivalent
- 9. Galvanized steel building entry riser pipe - 2" for cable - 1/2" for locate wire
- 10.Single gang weatherproof outlet box for locate wire
- 11.Wall mount Termination Panel/Network Interface Device - 6 LC-UPC port termination and splice capacity - Total Cable Solutions FPP-02-W-18 product or equivalent.
- 12.Consumables and Installation hardware - Contractor required consumables for the installation of all the above items and Owner-provided items per these Request for Bid Documents.

T6.02 Owner Provided Materials

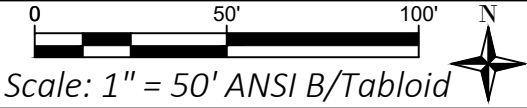
The owner will provide all fiber optic cables for this Project.

T6.03 Contractor Completion Clause

The Contractor is required to complete the installation with the material included in their Bid response.



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SHEET GROUP:
PLACEMENT DETAILS

SHEET ID:
P3

